

THE
ONTARIO WATER RESOURCES
COMMISSION
REPORT ON
TWENTY MILE CREEK
STREAM SURVEY
COUNTIES OF LINCOLN AND WELLAND

1963

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ONTARIO WATER RESOURCES COMMISSION

REPORT ON FIELD INVESTIGATIONS

DATE OF EXAMINATION - November 14, 1963 PLACE - COUNTIES OF LINCOLN
AND WELLAND

MATTER INVESTIGATED - Twenty Mile Creek - Stream Survey

AT REQUEST OF - Routine

INSPECTION MADE IN COMPANY WITH -

OTHER PARTIES SEEN -

REPORTS TO BE SENT TO -

1. Mr. M. F. Duc, Clerk-Treasurer, Township of Louth, Box 230,
Jordan, Ontario.
2. Mr. O. E. Tallman, Clerk-Treasurer, Township of Clinton, Box 10,
Campden, Ontario.
3. Mr. L. M. Vaughan, Clerk-Treasurer, Township of Gainsborough,
St. Ann's, Ontario.
4. Mr. J. G. Killins, Clerk-Treasurer, Township of South Grimsby,
RR#3, Smithville, Ontario.
5. Mrs. N. Metcalfe, Clerk, Township of North Grimsby, Box 159,
Grimsby, Ontario.
6. Mr. Lewis Laidman, Clerk-Treasurer, Township of Binbrook, Binbrook
~~OTHER RECOMMENDATIONS TO THE EFFECT OF THE PROCEDURE TO BE FOLLOWED~~ - Ont.
7. Mrs. A. Reed, Clerk-Treasurer, Township of Glanford, Box 37,
Mount Hope, Ontario.
8. Dr. M. M. Fletcher, Medical Officer of Health, Wentworth County
Health Unit, Court House, Hamilton, Ontario.
9. Dr. J. M. McGarry, Medical Officer of Health and Director,
St. Catharines-Lincoln Health Unit, St. Cath.

REPORT BY

D. Decaire

D. Decaire

NOTE: This completed form to be attached to each report.

REPORT

ONTARIO WATER RESOURCES COMMISSION

Municipality COUNTIES OF LINCOLN AND WELLAND Date of Inspection November 14, 1963.

Re: Twenty Mile Creek - Stream Survey

Field Inspection by D. Decaire, C.S.I.(C) Report by D. Decaire

On the above date water samples were collected from pre-selected sampling stations on the Twenty Mile Creek. Similar surveys were conducted in July 1960, September 1961 and August 1962. The laboratory results of the water sample analyses are appended, together with an explanation of the significance of the analyses. The locations of the sampling stations are plotted on the watershed map which is also appended to the report.

TWENTY MILE CREEK WATERSHED

The Twenty Mile Creek watershed comprises an area of approximately 124 square miles. The creek rises near the southern boundary of the City of Hamilton and extends for approximately 48 miles to its junction with Lake Ontario. The two main tributaries of the Twenty Mile Creek are Spring Creek and Three Mile Creek.

Ground water discharges by springs to the Twenty Mile Creek are minimal and following periods of low precipitation, some sections of the creek become dry. However, there is generally water in the depressions of the creek bed. The

sampling surveys were conducted during periods of dry weather in July 1960, August 1962 and November 1963. During these sampling periods, there was no continual flow throughout the length of the stream. There had been considerable rainfall prior to the sampling survey in September 1961, and there was a continuous flow in the stream.

USES OF TWENTY MILE CREEK

Jordan Harbour is located on the south side of the Queen Elizabeth Highway, near the junction of the Twenty Mile Creek and Lake Ontario. The Jordan Harbour is used extensively for recreation. Summer uses include fishing and boating and in winter, the harbour provides a good ice skating surface.

The point where the Twenty Mile Creek flows over the escarpment is known as Ball's Falls. This area is picturesque and offers considerable potential for the development of recreational facilities, especially if conservation dams were constructed in the watercourse.

In the vicinity of Fulton, a private park has been developed. This recreational area is called "McVey Park".

The Twenty Mile Creek also provides drinking water for cattle and is a source of farm irrigation water.

SOURCES OF POLLUTION

A sewage stabilization lagoon has been constructed to serve the Police Village of Smithville. This installation should contribute substantially toward the reduction of the pollution of the Twenty Mile Creek.

The Bethesda Home near Campden is served with a sewage stabilization lagoon which overflows to a watercourse tributary to the Twenty Mile Creek.

The Police Village of Vineland contributes septic tank effluent to the waters of Jordan Harbour. During a recent referendum, the residents of Vineland voted against the proposed sewerage project. The municipality should reconsider this issue in an effort to improve the sanitary condition of the Jordan Harbour.

Some industries in the watershed also contribute to the pollution of the Twenty Mile Creek. The Jordan Wines Limited have constructed a lagoon which receives the major portion of the industrial wastes from the winery, but other improvements in process waste water disposal are required to ensure the protection of Twenty Mile Creek from undue pollution.

The following food processing establishments in the watershed have constructed suitable waste water disposal facilities: Gos and Gris Cheese Factory, Paron Cheese Factory, Peconi's Dead Stock Removal and Gainsborough Packers Company. Soby's Dairy in

the Township of North Grimsby is considering the broad irrigation method of waste water disposal. The septic tank and tile bed system serving Louis' Cured Meats in Glanford Township, has not proven entirely satisfactory.

The Twenty Mile Creek flows through land which is primarily agricultural and much of the pollution can be related to barn yard drainage, land fertilization and the presence of farm animals on the land adjoining the creek.

ANALYSES OF SAMPLES

The Ontario Water Resources Commission objectives for stream sanitation include a maximum of 4 ppm of biochemical oxygen demand (BOD) and a maximum of 2,400 coliforms per 100 ml. With regard to these objectives, it is noted that the Twenty Mile Creek was more polluted during the 1960 sampling survey than in subsequent surveys. The improvement may be partly attributed to the progress made by the industries in the watershed in providing suitable disposal facilities. The 1961 survey was completed during a period of relatively good stream flow and the bacteriological results were satisfactory although a few of the samples contained BOD in excess of the OWRC objectives. During the 1962 and 1963 surveys, the water of the various sampling stations was usually stagnant and the excessive values of BOD may be partly attributed to decaying vegetation in the watercourse. In those samples where the BOD was high and the concentration of coliform organisms was

low, the pollution cannot be attributed to faecal matter.

It should be noted that the sample results were erratic and the adverse samples were not necessarily related to immediate sources of upstream pollution. Water stagnation has a definite influence on the water quality.

CONCLUSIONS

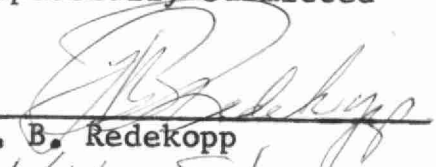
The most important function of the Twenty Mile Creek is land drainage, although the stream has limited uses for agricultural and recreational purposes in addition to being a receiver of both treated and untreated waste waters. Pollution of agricultural origin is generally accepted as unavoidable. Considerable progress has been made regarding the control of pollution from domestic and industrial sources.

RECOMMENDATIONS

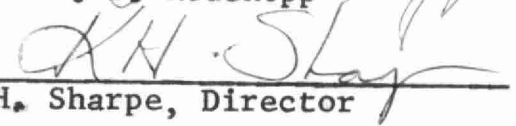
1. The Police Village of Vineland should take action to prevent the discharge of untreated waste water to the Jordan Harbour.
2. The Jordan Wines Limited should provide treatment for all contaminated waste water from the winery.
3. Improved disposal facilities should be provided by the Louis' Cured Meats and Soby's Dairy.

All of which is respectfully submitted

District Engineer


A. B. Redekopp

Approved by


K. H. Sharpe, Director

/ct

Date	Sampling Pt. No.	Description	5-Day BOD (ppm)	Solids (ppm)		Turbidity in Silica Units	M.F. Coliform per 100 ML
				Total	Susp.		
July 27/60	J0.1	20 Mile Creek at	9.6			19	5
Sept 14/61	"	Queen Elizabeth Hwy	3.5	262	36		10
Aug 13/62	"		1.6	278		8.0	3,000
Nov 14/63	"		4.2	254	43		1,040
July 27/60	J2.4	20 Mile Creet at	108			25	8,700
Sept 14/61	"	Concession Road 3,	3.6	364	14		10
Aug 13/62	"	Louth Twp.	1.6	290		27	2,000
Nov 14/63	"		2.3	616	3		30
July 27/60	J3.2	20 Mile Creek at	7.3			3	37
Sept 14/61	"	Highway No. 8	1.7	354	12		0
Aug 13/62	"		1.2	308		27	90
Nov 14/63	"		2.9	518	1		10,000
July 27/60	J5.0	20 Mile Creek at	13.0			7	5,200
Sept 14/61	"	Clinton - Louth Twp.	2.5	376	30		10
Aug 13/62	"	Line	2.2	294		31	370
Nov 14/63	"		2.9	674	1		830
July 27/60	JS7.6	Spring Creek at	24.0			26	970
Sept 14/61	"	Tintern Side Road	4.8	358	32		10
Aug 13/62	"		1.2	342		13.5	190
Nov 14/63	"		3.5	672	4		460
July 27/60	J7.6	20 Mile Creek at	25.0			45	330
Sept 14/61	"	Concession Road 9,	4.0	594	50		10
Aug 13/62	"	Clinton Twp.	2.8	344		48	360
Nov 14/63	"		3.9	502	11		26,700

Date	Sampling Pt. No.	Description	5-Day BOD (ppm)	Total Solids (ppm)	Susp.	Diss.	Turbidity in Silica Units	M.F. Coliform per 100 ML
July 27/60	J 13.6	20 Mile Creek	11.0				36	690
Sept 14/61	"	opposite Beamsville	3.2	750	72	678		10
Aug 13/62	"	side road	4.0	370			45	4,000
Nov 14/63	"		3.1	684	12	672		370
July 27/60	J 17.4	20 Mile Creek at	5.7				5	2,900
Sept 14/61	"	South Grimsby-	2.8	768	50	718		2
Aug 13/62	"	Gainsborough Twp.	1.6	374			27	4,000
Nov 14/63	"	Line- $\frac{1}{2}$ mile south east of Smithville	3.3	2180	9	2171		1,170
July 27/60	J 18.1	20 Mile Creek at	7.6				5	23,900
Sept 14/61	"	Smithville at side	2.2	598	28	570		0
Aug 13/62	"	road west of TH&B	2.2	358			24	4
Nov 14/63	"	railroad	10.0	6286	60	6226		1,500
July 27/60	J 22.8	20 Mile Creek at	12.0				6	1,900
Sept 14/61	"	side road south-east	2.7	464	8	446		10
Aug 13/62	"	of Kimbo	3.6	360			65	3,000
Nov 14/63	"		7.3	1350	8	1342		70
July 27/60	J 32.8	20 Mile Creek at	13.0				8	230
Sept 14/61	"	Binbrook-South Grimsby	3.1	250	24	226		10
Aug 13/62	"	Twp. Line	1.5	330			5.5	30
Nov 14/63	"		4.8	484	22	462		510
July 27/60	J 42.8	20 Mile Creek at side	13.0				45	270
Sept 14/61	"	road to Hannon	4.8	302	28	274		10
Aug 13/62	"		2.0	322			31	390
Nov 14/63	"		8.8	398	48	350		290

Date	Sampling Pt. No.	Description	5-Day BOD (ppm)	Solids (ppm)			Turbidity in Silica Units	M.F. Coliform per 100 ML
				Total	Susp.	Diss.		
July 27/60	JT47.5	3 Mile Creek at	3.6				12	7,400
Nov 14/63	"	Hwy 6 North of Mount Hope	2.9	352	16	336		2,100
July 27/60	JT45.2	3 Mile Creek at	18.0	325				12,000
Aug 13/62	"	Glanford Station Side Road	1.8	350			13	380
July 27/60	J45.6	20 Mile Creek at	4.4				10	53
Sept 14/61	"	Concession Road 2,	2.6	328	32	296		10
Aug 13/62	"	Glanford Twp.	1.0	420			29	56
Nov 14/63	"		16.0	1620	688	932		100
July 27/60	J47.6	20 Mile Creek at	4.2				27	14,000
Sept 14/61	"	Hwy 6, Smith of	6.6	628	64	564		10
Nov 14/63	"	Ryckman	4.0	618	36	582		300

APPENDIX

EXPLANATION & SIGNIFICANCE OF LABORATORY ANALYSES

ALL THE LABORATORY TESTS INCLUDED IN THIS REPORT WERE PERFORMED AT THE ONTARIO WATER RESOURCES COMMISSION LABORATORY IN TORONTO.

A. BACTERIOLOGICAL EXAMINATION

THE MEMBRANE FILTER TECHNIQUE IS USED TO OBTAIN A DIRECT ENUMERATION OF COLIFORM ORGANISMS. THESE ORGANISMS ARE NORMAL INHABITANTS OF THE INTESTINES OF MAN AND OTHER WARM-BLOODED ANIMALS. THEY ARE ALWAYS PRESENT IN LARGE NUMBERS IN SEWAGE AND ARE GENERALLY MINIMAL IN OTHER WATER POLLUTANTS.

THE RESULTS OF THE EXAMINATIONS ARE REPORTED AS "MF COLIFORM COUNT PER 100 ML".

THE COMMISSION'S OBJECTIVE FOR STREAM SANITATION IS A COLIFORM DENSITY OF NOT GREATER THAN 2,400 ORGANISMS PER 100 ML.

B. SANITARY CHEMICAL ANALYSES

BIOCHEMICAL OXYGEN DEMAND (BOD):

BIOCHEMICAL OXYGEN DEMAND IS REPORTED IN PARTS PER MILLION (PPM), AND IS AN INDICATION OF THE AMOUNT OF OXYGEN REQUIRED FOR THE STABILIZATION OF DECOMPOSABLE ORGANIC MATTER IN THE WATER. THE COMPLETION OF THE LABORATORY TEST REQUIRES FIVE DAYS, UNDER THE CONTROLLED INCUBATION TEMPERATURE OF 20°C.

THE COMMISSION OBJECTIVE FOR STREAM WATER QUALITY IS AN UPPER LIMIT OF 4 PPM.

SOLIDS:

THE VALUE FOR TOTAL SOLIDS, EXPRESSED IN PARTS PER MILLION (PPM), IS THE SUM OF THE VALUES FOR THE SUSPENDED AND THE DISSOLVED MATTER IN THE WATER. THE CONCENTRATION OF SUSPENDED SOLIDS IS GENERALLY THE MOST SIGNIFICANT OF THE SOLIDS ANALYSES IN REGARD TO STREAM WATER QUALITY.

THE EFFECTS OF SUSPENDED SOLIDS IN WATER ARE REFLECTED IN DIFFICULTIES ASSOCIATED WITH WATER PURIFICATION, DEPOSITIONS IN STREAMS, AND INJURY TO THE HABITAT OF FISH.

WHERE SUSPENDED SOLIDS VALUES ARE LESS THAN 20 PPM LABORATORY DIFFICULTIES ARE EXPERIENCED AND THE TURBIDITY IS DETERMINED INSTEAD.

TURBIDITY:

TURBIDITY IS CAUSED BY THE PRESENCE OF SUSPENDED MATTER, SUCH AS CLAY, SILT, FINELY DIVIDED ORGANIC MATTER, PLANKTON AND OTHER MICROSCOPIC ORGANISMS IN WATER. IT IS AN EXPRESSION OF THE OPTICAL PROPERTY OF A SAMPLE AND RESULTS ARE REPORTED IN "SILICA UNITS".



ONTARIO WATER RESOURCES COMMISSION

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